HP StorageWorks QLogic Fibre Channel host bus adapters for ProLiant and Integrity servers using Linux and VMware operating systems release notes

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Description

These release notes contain driver, firmware, and other supplemental information for the QLogic Fibre Channel host bus adapters (HBAs) for ProLiant and Integrity servers using Linux and VMware ® operating systems. See Product models for a list of supported HBAs.

What's new?

- RHEL 5 U3 using in-box driver
- Multipath failover using Device Mapper Multipath
- HBAnyware

Prerequisites

Before you perform HBA updates, you must:

- Ensure that the system is running one of the operating system versions in "Operating systems" on page 4.
- Starting with RHEL 5 U3, fibre channel HBAs and mezzanine cards are supported by Red Hat in-box drivers (provided as part of the O/S distribution), and multipath failover is now handled by Device Mapper.
- See the HP server PCI slot specifications to determine if your server is compatible with these HBAs.
- If you are installing the Linux operating system for the first time, load the operating system and then download and install the supported Linux HBA driver from the HP website: http://welcome.hp.com/country/us/en/support.html.

Product models

The following HBAs and Mezzanine Cards Support Linux on ProLiant servers:

- HP StorageWorks 81Q PCIe FC HBA (product number AK344A)
- HP StorageWorks 82Q PCIe FC HBA (product number AJ764A)
- HP StorageWorks FC1242SR PCI Express HBA (product number AE312A)
- HP StorageWorks FC1243 PCI-X 2.0 4Gb HBA (product number AE369A)
- HP StorageWorks FCA2214 PCI-X HBA (product number 281541-B2)
- HP StorageWorks FCA2214 DC PCI-X HBA (product number 321835-B21)
- HP BL20p G2 FC p-class Mezzanine Adapter (product number 300874-B21)
- HP BL20p G3, G4 p-class FC Mezzanine Adapter (product number 361426-B21)
- HP BL30p/BL35p p-class Dual-Port FC Mezzanine Adapter (product number 354054-B21)
- HP BL25p/BL45p p-class G2 FC Mezzanine Adapter (product number 381881-B21)

The following HBAs and Mezzanine HBAs support Linux on BOTH ProLiant and Integrity Servers:

- HP StorageWorks FC1143 PCI-X 2.0 4Gb HBA (product number AB429A)
- HP StorageWorks FC1142SR PCI Express HBA (product number AE311A)
- HP QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem (product number 403619-B21)

The following HBAs support Linux *only* on Integrity servers:

- HP PCI-e dual-port 4Gb FC adapter (product number AD300A)
- HP PCI-X dual-port 4Gb FC adapter (product number AB379A)
- HP PCI-X dual-port 4Gb FC adapter (product number AB379B)
- HP Q2300 PCI-X 2GB FC HBA (product number A7538A)
- HP A6826A PCI-X Dual Port 2GB FC HBA (product number A6826A)

Devices supported

The QLogic HBAs for Linux are supported on HP servers that support:

- the Linux operating systems described in Operating systems.
- the servers listed on the HP website:
  http://www.hp.com/products1/serverconnectivity/support_matrices.html.
- B-Series, C-Series, M-series and 8Gb Simple SAN Connection switch products. For the latest information, see the HP support website: http://welcome.hp.com/country/us/en/support.html, as well as the *HP StorageWorks SAN design reference guide* at http://h18006.www1.hp.com/products/storageworks/san/documentation.html.
- the following storage arrays:
  - Modular Smart Array 1000
  - Modular Smart Array 1500
  - Enterprise Virtual Array 3000/5000 GL
  - Enterprise Virtual Array 4000/4100/4400/6000/6100/8000/8100
  - XP128/1024, XP10000/12000 and XP20000/24000
- MSA2000 is supported starting with RHEL5 U1, and SLES10 SP1 using Device Mapper failover.
- MSA1000 and MSA1500 are not supported with the 81Q or 82Q HBAs with RHEL 4U5 or RHEL 4U6.
- MSA1000 and MSA1500 are not supported in Active/Passive mode with SLES10 SP2.

NOTE:

Starting with RHEL5 U3 and SLES10 SP3, active/passive MSA and EVA arrays are no longer supported.

Linux operating systems

Linux on ProLiant

The following versions of Linux are supported on ProLiant servers.

Table 1 lists software support with the following 2.6 versions of x86 and x64 Linux: RHEL 5 U3 (2.6.18.128).

HBAs	**Driver**	**BIOS**	**Multi-boot image**	**SANsurfer**
81Q (AK344A)	8.02.00.06.05.03-k	2.02	2.03	5.0.1b41

82Q (AJ764A)	8.02.00.06.05.03-k	2.02	2.03	5.0.1b41
FC1242SR (AE312A)	8.02.00.06.05.03-k	2.0	1.73	5.0.1b41
FC1142SR (AE311A)	8.02.00.06.05.03-k	2.0	1.73	5.0.1b41
FC1243 (AE369A)	8.02.00.06.05.03-k	2.0	1.73	5.0.1b41
FC1143 (AB429A)	8.02.00.06.05.03-k	2.0	1.73	5.0.1b41
FCA2214	8.02.00.06.05.03-k	1.45	n/a	5.0.1b41
FCA2214DC	8.02.00.06.05.03-k	1.45	n/a	5.0.1b41
QMH2462 c-Class Mezz	8.02.00.06.05.03-k	2.08	1.76af	5.0.0b41
HP BL20p G3, G4 FC	8.02.00.06.05.03-k	1.45	n/a	5.0.0b41
HP BL25p/BL45p G2	8.02.00.06.05.03-k	1.48	n/a	5.0.0b41
HP BL30p/BL35p Dual-Port FC Mezz	8.02.00.06.05.03-k	1.45	n/a	5.0.0b41
HP BL20p G2 FC Mezz	8.02.00.06.05.03-k	1.45	n/a	5.0.0b41

Table 2 lists the Linux versions that are supported on servers with 8Gb HBAs that have a minimum kernel of RHEL 4 U5 (2.6.9-55), RHEL 4 U6 (2.6.9-67), RHEL5 U1 (2.6.18-53), RHEL5 U2 (2.6.18-92), SLES9 SP3 (2.6.5-7.286), SLES9 SP4 (2.6.5-7.308), SLES10 SP1 (2.6.16.54-0.2.3) and SLES10 SP2 (2.6.16.60-0.21). Boot from SAN (BFS) is not supported with SLES9 SP3 and RHEL4 U5.

Driver	<BIOS	Multi-boot image	SANsurfer	
81Q (AK344A)	8.02.11	2.02	2.03	5.0.1b31
82Q (AJ764A)	8.02.11	2.02	2.03	5.0.1b31

Table 3 lists software support with the following 2.6 versions of x86 and x64 Linux: RHEL4 U5 and U6, RHEL5 U1 and U2, SLES9 SP3 and SP4, SLES10 SP1 and SLES10 SP2.

HBAs	Driver	BIOS	Multi-boot image	SANsurfer Utiliy
FC1242SR (AE312A)	8.02.11	2.00	1.73	5.0.1b31
FC1142SR (AE311A)	8.02.11	2.00	1.73	5.0.1b31
FC1243 (AE369A)	8.02.11	2.00	1.73	5.0.1b31
FC1143 (AB429A)	8.02.11	2.00	1.73	5.0.1b31
FCA2214	8.02.11	1.45	n/a	5.0.1b31
FCA2214DC	8.02.11	1.45	n/a	5.0.1b31
QMH2462 c-Class Mezz	8.01.07.25	1.26	1.64	5.0.0b32
HP BL20p G3, G4 FC	8.01.07.25	1.45	n/a	5.0.0b32
HP BL25p/BL45p G2	8.01.07.25	1.48	n/a	5.0.0b32

HP BL30p/BL35p Dual-Port FC Mezz	8.01.07.25	1.45	n/a	5.0.0b32
HP BL20p G2 FC Mezz	8.01.07.25	1.45	n/a	5.0.0b32

The minimum supported 2.6 kernel versions are RHEL4 U5 (2.6.9-55), RHEL4 U6 (2.6.9-67), RHEL5 U1 (2.6.18-53), RHEL5 U2 (2.6.18-92), SLES9 SP3 (2.6.5-7.286), SLES9 SP4 (2.6.5-7.308), SLES10 SP1 (2.6.16.54-0.2.3) and SLES10 SP2 (2.6.16.60-0.21).

Table 4 lists software support with the following 2.4 versions of x86 and x64 Linux: RHEL3 U8 and U9 and SLES8 SP4.

HBA	RHEL 3 Driver	SLES 8 Driver	BIOS	Multi-boot image	SANsurfer Utility
FC1242SR (AE312A)	7.07.05.08	7.07.05.02	1.26	1.64	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
FC1142SR (AE311A)	7.07.05.08	7.07.05.02	1.26	1.64	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
QMH2462 c-Class Mezz	7.07.05.08	7.07.05.02	1.26	1.64	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
FC1243 (AE369A)	7.07.05.08	7.07.05.02	1.26	1.64	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
FC1143 (AB429A)	7.07.05.08	7.07.05.02	1.26	1.64	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
FCA2214	7.07.05.08	7.07.05.02	1.45	n/a	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
FCA2214DC	7.07.05.08	7.07.05.02	1.45	n/a	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
HP BL20p G3, G4 FC	7.07.05.08	7.07.05.02	1.45	n/a	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
HP BL25p/BL45p G2	7.07.05.08	7.07.05.02	1.48	n/a	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
HP BL30p/BL35p Dual-Port FC Mezz	7.07.05.08	7.07.05.02	1.45	n/a	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)
HP BL20p G2 FC Mezz	7.07.05.08	7.07.05.02	1.45	n/a	5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)

Linux on Integrity

The following versions of Linux are supported on Integrity servers:

Table 5 lists software support with the following 2.6 versions of Itanium Linux: RHEL4 U5 and U6, RHEL5 U1 and U2, SLES9 SP3 and SP4, SLES10 SP1 and SLES10 SP2.

HBA	Driver	EFI	EFI utility	Multi-boot image	SANsurfer utility
AD300A	8.02.11	2.00	2.48	1.73	5.0.1b31
AB379A	8.02.11	2.00	2.48	1.73	5.0.1b31
AB379B	8.02.11	2.00	2.48	1.73	5.0.1b31
AB429A	8.02.11	2.00	2.48	1.73	5.0.1b31
A6826A	8.02.11	1.49	2.07	n/a	5.0.1b31
A7538A	8.02.11	1.49	2.07	n/a	5.0.1b31
QMH2462 4Gb c-Class Mezz	8.01.07.25	1.09	2.30	1.64	5.0.0b32

The minimum supported 2.6 kernel versions are RHEL4 U5 (2.6.9-55), RHEL4 U6 (2.6.9-67), RHEL5 U1 (2.6.18-53), RHEL5 U2 (2.6.18-92), SLES9 SP3 (2.6.5-7.286), SLES9 SP4 (2.6.5-7.308), SLES10 SP1 (2.6.16.54-0.2.3) and SLES10 SP2 (2.6.16.60-0.21) .

Table 6 lists software support with the following 2.4 versions of Itanium Linux: RHEL3 release U8 and U9 .

HBA	RHEL 3 Driver	EFI	EFI utility	Multi-boot image	SANsurfer utility
A6826A	7.07.05.08	1.49	2.07	n/a	5.0.0b22
A7538A	7.07.05.08	1.49	2.07	n/a	5.0.0b22

VMware

HP fully supports the use of Windows and Linux as a guest OS on VMware ESX versions 2.5.x and 3.x. When running VMware, fibre channel HBAs are supported by in-box drivers supplied with ESX. Windows and Linux FC HBA drivers are not used on the Virtual O/S.

NOTE:

You do not need to install the QLogic driver since it is shipped in-box with the ESX server.

To insure that your HBA is fully supported by HP and VMware, refer to one of the following websites:

For VMware ESX version 3.x, see the website:

http://www.vmware.com/support/pubs/vi_pages/vi_pubs_35.html

Table 7 lists software support with the following 2.4versions of x86 ESX server: 3.5 US build 110268

HBA	Driver	BIOS	>Multi-boot image	SANsurfer utility
QLE2462	7.08–vm33.1	2.02	1.73af	5.0.1b34
QLE2460	7.08–vm33.1	2.02	1.73af	5.0.1b34
QLA2462	7.08–vm33.1	2.02	1.73af	5.0.1b34
QLA2460	7.08–vm33.1	2.00	1.73f	5.0.1b34
QLE2562	7.08–vm33.1	2.02	2.03af	5.0.1b34
QLE2560	7.08–vm33.1	2.02	2.03af	5.0.1b34
QMH2462	7.08–vm33.1	1.26	1.64	5.0.1b34

Table 8 lists software support with the following 2.4versions of x86 Esx server: 3.5 US build 123630

HBA	Driver	BIOS	Multi-boot image	>SANsurfer utility
QLE2462	7.08–vm33.3	2.02	1.73af	5.0.1b34
QLE2460	7.08–vm33.3	2.02	1.73af	5.0.1b34
QLA2462	7.08–vm33.3	2.02	1.73af	5.0.1b34
QLA2460	7.08–vm33.3	2.00	1.73f	5.0.1b34
QLE2562	7.08–vm33.3	2.02	2.03af	5.0.1b34
QLE2560	7.08–vm33.3	2.02	2.03af	5.0.1b34
QMH2462	7.08–vm33.1	1.26	1.64	5.0.1b34

Table 9 lists software support with the following 2.4 versions of x86 ESX server: 3.5 US build xxxxxx

HBA	Driver	BIOS	Multi-boot image	SANsurfer utility
QLE2462	7.08–vm66	2.08	1.73af	5.0.1b34
QLE2460	7.08–vm66	2.08	1.73af	5.0.1b34
QLA2462	7.08–vm66	2.08	1.73af	5.0.1b34
QLA2460	7.08–vm66	2.08	1.73af	5.0.1b34
QLE2562	7.08–vm66	2.08	2.03af	5.0.1b34
QLE2560	7.08–vm66	2.08	2.03af	5.0.1b34
QMH2462	7.08–vm66	2.08	1.64	5.0.1b34

Boot from SAN on VMware

To perform a Boot from SAN on VMware, see the document, *HP StorageWorks Fibre Channel host bus adapters software guide for Linux* at the website http://bizsupport2.austin.hp.com/bc/docs/support/SupportManual/c01672721/c01672721.pdf.

Installing the driver

You do not need to install the QLogic driver since it ships in-box with the ESX server.

NOTE:

VMware ESX 3.x.x is not supported on the IA64 architecture.

Installing the Linux device driver using Red Hat in-box driver

For instructions on how to install Linux while using the in-box drivers, see the HP website: http://www.hp.com, then search for *device mapper + boot + san*.

You will need to install the HP-supplied Device Mapper Multipath Kit, after installing the operating system, should a multiple path redundancy need exist. See the HP website: http://www.hp.com/go/devicemapper

You will also need to install the new `hp-fc-enablement` kit, after installing the operating system.

HP Fibre Channel Enablement Kit

The HP Fibre Channel Enablement Kit provides additional libraries and configuration utilities to enable HP StorageWorks fibre channel storage arrays to work with Linux. The Fibre Channel Enablement Kit is not required to use the `lpfc` and `qla2xxx` kernel modules but it does provide configuration scripts to make sure that they the correct settings to work with HP StorageWorks fibre channel arrays. The Fibre Channel Enablement kit also sets the correct `lpfc` and `qla2xxx` kernel module setting that are used with Device Mapper Multipathing.

NOTE:

If you are using any HP managmenet applications you will need the `HBAAPI` libraries that come with the hp-fc-enablement RPM.

Installing the HP Fibre Channel Enablement Kit

To install the HP Fibre Channel Enablement Kit, do the following:

1. Download the hp-fc-enablement-yyyy-mm-dd.tar.gz file for your operating system and copy it to the target server
2. Untar the enablement kit by executing the command to create the directory, `hp-fc-enablement-yyyy-mm-dd`.

   ```
   # tar zxvf hp-fc-enablement-yyyy-mm-dd.tar.gz
   ```

3. Browse to the directory `hp-fc-enablement-yyyy-mm-dd`.
4. Do one of the following to execute the `install.sh` script.
   a. If you are not using Device Mapper multipathing execute the following command:
      ```
      # ./install.sh -s
      ```
   b. If you are using Device Mapper multipathing execute the following command:
      ```
      # ./install.sh -m
      ```
      The `hp-fc-enablement` and `fibreutils` RPMs should be installed once this install completes. To verify the installation, enter the following commands:
      ```
      # rpm -q hp-fc-enablement
      # rpm -q fibreutils
      ```

NOTE:

For use with the driver that comes with the kernel you will need fibreutils 3.x or greater.

Uninstall

To uninstall the Fibre Channel Enablement Kit, untar the kit as mentioned in the installation steps 1 through 3, then execute the `install.sh` script with the following flag:

```
# ./install.sh -u
```

To uninstall the RPMs in the enablement kit manually, enter the commands:

```
# rpm -e hp-fc-enablement
# rpm -e fibreutils
```

Installing HP supported QLogic driver (pre RHEL 5 U3)

HP does not currently support the driver that comes with the Linux kernel. Instead, you need to install an appropriate driver from the Fibre Channel HBA website:

http://h18006.www1.hp.com/storage/saninfrastructure/hba.html.

To obtain the HBA driver, download the appropriate driver kit for your operating system.

To install Linux on a BFS LUN with driver versions that are not supported by the initial O/S release, the new driver must be integrated as part of the installation process using a DD-kit.

Driver failover mode

If you use the INSTALL command with no flags, the driver's failover mode depends on whether a QLogic driver is already loaded in memory, (i.e. listed in the output of the `lsmod` command). Possible driver failover mode scenarios include:

- If an hp_qla2x00src driver RPM is already installed, then the new driver RPM will use the failover of the previous driver package.
- If there is no QLogic driver module (qla2xxx module) loaded, the driver will default to failover mode. This is also true if an inbox driver is loaded that does not list output in the `/proc/scsi/qla2xxx` directory.

- If there is a driver that is loaded in memory that lists the driver version in `/proc/scsi/qla2xxx` but no driver RPM has been installed, then the driver RPM will load the driver in the failover mode that the driver in memory is currently in.

Installation instructions

1. Download the appropriate driver kit for your distribution. The driver kit file will be in the format `hp_qla2x00-yyyy-mm-dd.tar.gz`.
2. Copy the driver kit to the target system.
3. Uncompress and untar the driver kit using the following command:

   ```
   # tar zxvf hp_qla2x00-yyyy-mm-dd.tar.gz
   ```
4. Change directory to the `hp_qla2x00-yyyy-mm-dd` directory.
5. Execute the `INSTALL` command.

   The `INSTALL` command syntax will vary depending on your configuration. If a previous driver kit is installed, you can invoke the `INSTALL` command without any arguments as the script will use the currently loaded configuration:

   ```
   # ./INSTALL
   ```

   To force the installation to failover mode, use the `-f` flag:

   ```
   # ./INSTALL -f
   ```

   To force the installation to single-path mode, use the `-s` flag:

   ```
   # ./INSTALL -s
   ```

   Use the `-h` option of the `INSTALL` script for a list of all supported arguments. The `INSTALL` script will install the appropriate driver RPM for your configuration, as well as the appropriate fibreutils RPM. Once the `INSTALL` script is finished, you will either have to reload the QLogic driver modules (qla2xxx, qla2300, qla2400, qla2xxx_conf) or reboot your server.

   The commands to reload the driver are:

   ```
   # /opt/hp/src/hp_qla2x00src/unload.sh
   # modprobe qla2xxx_conf
   # modprobe qla2xxx
   # modprobe qla2300
   # modprobe qla2400
   ```

   The command to reboot the server is:

   ```
   # reboot
   ```

△ CAUTION:

If your boot device is a SAN attached device you will have to reboot your server.

To verify which RPM versions are installed, use the `rpm` command with the `-q` option.

For example:

```
# rpm -q hp_qla2x00src
```

```
# rpm -q fibreutils
```

Installing the operating system using a DD-kit

This section pertains to the 81Q and 82Q PCIe 8Gb HBAs. DD-kits for both Novell and Red Hat can be found in a single compressed file. The file will be located in the **Driver - Storage Controllers - FC HBA** section of the **Download drivers and software** page after selecting the HBA then the operating system to be installed. The files are in a ISO format that require expanding. Use a CD burner software to expand the ISO file matching the operating system being installed.

Installing Novell SLES9 SP4 and SLES10 SP1 with a DD-kit

1. Insert the **Novell product CD #1** into the CD drive and boot the system.
2. On the main installation screen, press **F5**. Three options appear: **Yes**, **No**, or **File**.
3. Select **Yes**.
4. Select an installation option, and press **Enter**.

   A prompt asking you to choose the driver update medium appears.
5. With the **DD-kit CD** in the CD drive, press **Enter** to start loading the driver update to the system.

   If the driver update was successful, the message, `Driver Update OK` will appear.
6. Press **Enter**.

   If the system prompts you to update another driver, click **Back**, then press **Enter**. A message asking you to make sure that **CD #1** is in your drive appears.
7. Insert **CD #1** into the CD drive and press **OK**.
8. Follow the on-screen instructions to complete the installation.

Installing Red Hat RHEL4 U6 and RHEL5 U1 with a DD-kit

1. Insert **Red Hat product CD #1** in the CD drive and boot the system.

   The system boots from the CD and stops at the boot prompt.
2. Enter `Linux dd` at the boot prompt, then press **Enter**.

   The message, `Do you have a driver disk?` appears.
3. Click **Yes**, then press **Enter**.
4. From the Driver Disk Source window, select the driver source: `Select hdx (where x=CD drive letter)`, then press **Enter**. The Insert Driver Disk window displays.
5. Insert the **DD-kit disk** into the CD drive.
6. Click **OK**, then press **Enter**.

   This loads the driver update to the system. The Disk Driver window displays, prompting for more drivers to install.
7. Click **No**, then press **Enter**.
8. Insert **CD #1** in the drive and press **OK**.
9. Follow the on-screen instructions to complete the installation.

Boot From SAN (BFS) and 8Gb Fibre Channel Host Bus Adapters (HBA)

If you are using a Fibre Channel HBA that is capable of 8Gb transfer speeds and you are using either Red Hat Enterprise Linux 5.1 or earlier or SUSE Linux Enterprise Server (SLES) 10 Service Pack (SP) 1 or earlier, you must install the HP driver kit, before installing the ProLiant Support Pack (PSP), that you can download from the website:

http://h18006.www1.hp.com/storage/saninfrastructure/hba.html

The reason for this is that the Fibre Channel HBA drivers in PSP version 8.0 and earlier do not support Fibre Channel HBAs that are capable of transfer speeds of 8Gb. If you fail to install Fibre Channel HBA drivers that support these Fibre Channel HBAs, you may lose access to your boot device. If you plan to install the PSP and have your boot device out in the SAN, it is recommended that you perform the following steps:

1. Install the operating system.
2. Install the HP driver kit for your Fibre Channel HBA
3. Install the PSP.

This will ensure that the driver loaded by the operating system will discover Fibre Channel HBAs that are capable of 8Gb transfer speeds.

VMWare

HP fully supports the use of Windows and Linux as a guest O/S on VMware ESX versions 2.5.x and 3.x. When running VMware, Fibre Channel HBAs are supported by embedded drivers supplied with ESX. Windows and Linux FC HBA drivers are not used. To insure that your HBA is fully supported by HP and VMware, please go to one of the websites below:

For VMware ESX version 3.x, see the website:

http://www.vmware.com/support/pubs/vi_pages/vi_pubs_35.html.

For VMware ESX version 2.5.x, see the website:

http://www.vmware.com/support/pubs/esx_pubs.html.

Important information

Presenting LUNs to a Linux host

When presenting XP LUNs to a Linux host,

- the LUNs must start with a LUN 0.
- the LUNs must be presented across all paths that are connected/configured from the XP storage array.
- If LUN 0 is not present, SANsurfer will show the XP array as offline.

Driver auto-compilation supported

What is auto-compilation?

Auto-compilation is the ability to have the QLogic Fibre Channel HBA driver automatically compile itself when a new kernel is loaded. The advantage of having the QLogic FC HBA driver compile itself automatically is that an administrator will not have to manually invoke the driver compile scripts, so that the new kernel is running the HP-approved FC HBA driver for QLogic.

How does auto-compilation work?

Auto-compilation is achieved by adding a trigger script to the kernel-source and kernel-devel RPMs in both Red Hat and Novell Linux distributions. What a trigger script does is when either the kernel-source or kernel-devel RPMs are either installed or upgraded, a small script will run and see if the QLogic FC HBA driver needs to be compiled for the new kernel. This script is actually located in `/opt/hp/src/hp_qla2x00src/smart_compile`.

What happens is this script is initially run when the `hp_qla2x00src RPM` is installed to take an inventory of kernels that have already been installed on the server. When the trigger script runs, it calls the smart compile script to compile the currently installed HP QLogic FC HBA driver for all the kernels that it does not have in its repository.

Once `smart_compile` is finished compiling the driver for all the newly installed kernels, it updates it inventory of kernels so that it contains the new kernels it just compiled the driver for. Thus, if `smart_compile` is run again it won't compile the drivers that it has already compiled the kernel for again.

Example 1. Auto-compilation example

An example of what would happen during an auto-compile is below:

1. User enables auto-compilation as specified in the section How to enable auto-compilation, page ?.
2. User installs the actual kernel binary RPM.
3. User installs the kernel development RPM (either kernel-source or kernel-devel).
4. Trigger script is run. If auto-compilation has been enabled, then `smart_compile` is run.
5. Auto-compilation script (`smart_compile`) compiles the QLogic FC HBA driver for the newly installed kernel

   The HP supported QLogic FC HBA driver will then load on next reboot.

How to enable auto-compilation

Auto-compilation of the QLogic driver is turned off by default. To enable auto-compilation, perform the following steps:

1. Change directory to `/opt/hp/src/hp_qla2x00src`.
2. Run the following command.

   ```
   # ./set_parm -a
   ```

   The script should then output that auto-compilation has been set to **yes**. If the output says that it has been set to **no**, simply rerun the `set_parm -a` command again as the `-a` switch simply toggles this functionality on and off.

How to disable auto-compilation

1. Change directory to `/opt/hp/src/hp_qla2x00src`.
2. Run the following command.

   ```
   # ./set_parm -a
   ```

   The script should then output that auto-compilation has been set to **no**. If the output says that it has been set to **yes**, simply rerun the `set_parm -a` command again as the `-a` switch simply toggles this functionality on and off.

NOTE:

When installing new kernels, in order for auto-compilation to work correctly, you must install the kernel rpm first, followed by the kernel development environment for the same kernel (kernel-source for SLES and kernel-devel for RHEL). Failure to do this will mean that the driver will not get compiled for the new kernel.

NOTE:

In order for auto-compile to work in RHEL 4, you must install the Kernel RPMs in the following order (perform steps 2 and3 if required).

1. `kernel-<version>.<arch>.rpm`
2. `kernel-<smp/largesmp/hugemem>-<version>.<arch>.rpm`
3. `kernel-<smp/largesmp/hugemem>-devel-<version>.<arch>.rpm`
4. `kernel-devel-<version>.<arch>.rpm`

About warning messages

During the Kernel upgrade process, the following messages can be ignored.

RHEL 4 All Updates

```
WARNING: No module qla2xxx_conf found for kernel 2.6.9-55.0.9.EL,
continuing anyway
```

SLES 10 All SPs

```
WARNING:
/lib/modules/2.6.18-8.1.8.el5/kernel/drivers/scsi/qla2xxx/qla2300.ko
needs unknown symbol qla2x00_remove_one

WARNING:
/lib/modules/2.6.18-8.1.8.el5/kernel/drivers/scsi/qla2xxx/qla2300.ko
needs unknown symbol qla2x00_probe_one

WARNING:
/lib/modules/2.6.18-8.1.8.el5/kernel/drivers/scsi/qla2xxx/qla2400.ko
needs unknown symbol qla2x00_remove_one

WARNING:
/lib/modules/2.6.18-8.1.8.el5/kernel/drivers/scsi/qla2xxx/qla2400.ko
needs unknown symbol qla2x00_probe_one
```

x86_64 SANsurfer benign messages

While the x86_64 SANsurfer RPM is installing, the following message may appear:

```
Command.run(): process completed before monitors could start.
```

This message can safely be ignored. SANsurfer will still install and run correctly. .

Dynamic target addition not supported

Dynamic target addition is defined as adding a new Fibre Channel target (such as adding a new storage array) to a SAN, presenting that new target to a Fibre Channel host bus adapter, and then prompting the operating system to do an online scan (such as using the `hp_rescan` utility that comes with fibreutils). This functionality is not supported with the QLogic failover driver. If you add a new Fibre Channel target to a host server, you must reboot that host server.

scsi_info command on older XP arrays

When running the `scsi_info` command on older XP arrays (such as the XP1024/128), you may see output similar to that shown in the following example. Ignore the error, and note that the XP array's WWN is not all zeros.

The XP array returns INQUIRY data that differs slightly from that returned by EVA or MSA arrays.

```
[root@coco /]# scsi_info /dev/sdal SCSI_ID="4,0,8,0":

VENDOR="HP":MODEL="OPEN-

E":FW_REV="5005":WWN="0000000000000000":LUN="5235303020303030-3130353930203030"

[root@coco /]# scsi_info /dev/sdam

SCSI_ID="4,0,8,1":VENDOR="HP":MODEL="OPEN-

E":FW_REV="5005":WWN="0000000000000000":LUN="5235303020303030-3130353930203030"

[root@coco /]# scsi_info /dev/sdan

SCSI_ID="4,0,9,0":VENDOR="HP":MODEL="OPEN-
3":FW_REV="2114":WWN="03000000002018e9":LUN="5234353120303030-3330313033203030"

[root@coco /]# scsi_info /dev/sdao
SCSI_ID="4,0,9,1":VENDOR="HP":MODEL="OPEN-

3":FW_REV="2114":WWN="0b00000000600000":LUN="5234353120303030-3330313033203030"
```

SANsurfer limitations

- As a safety mechanism, the SANsurfer application does not retain any updates when the user abruptly quits using the **Close/Exit** button. Users must click on the **Save** button for any changes or edits made to the HBA.
- Under certain conditions, some LUNS may not appear under the target in the left hand pane. Should this occur, refer to the LUNs displayed in the right hand pane. The O/S has visibility to all of the LUNs. The anomaly is the lack of LUNs being displayed under the target. This behavior is benign and may be ignored.
- With V5.0.1b31, there are a small number of help file links that are in error. These will be fixed in the next SANsurfer release.

- After updating the HBA firmware or multiboot image a system reboot is required.

Enabling extended error logging on 2GB cards

The **Enable Extended Error Logging** feature on 2GB cards sets the bit in the `/sys/module/qla2xxx/parameters` but does not clear it when disabled.

LUN Numbering Requirement

When presenting LUNs from a specific storage array to a server, each LUN number *must* be unique. Specifically, all LUN numbers from a specific storage array to a specific server must be unique. This LUN numbering requirement includes presenting LUN's from the same storage array, but to different sets of HBA ports in the same server. Also, the LUN numbers must be consistent across all HBA ports for the same physical LUN.

Controller Targets Require Data LUNs

After configuring a controller target, you must present at least one data LUN to the server (controller LUNs cannot be presented alone, without a data LUN).

XP load balancing

Automatic dynamic load balancing is not supported on HP XP arrays.

Compatibility and interoperability

- The HBAs support the servers and switches described in "Devices supported" on page 4, and support the operating systems described in "Operating systems" on page 4.
- HP recommends that you implement zoning by HBA, as described in *HP StorageWorks SAN design reference guide*, available on the website:
  http://h18006.www1.hp.com/products/storageworks/san/documentation.html.

Determining the current version

This section describes how to determine the HBA driver and firmware versions.

Using SANsurfer

To determine version information on Linux systems:

1. Open SANsurfer.
2. Click an HBA in the left pane to select it.
3. Click the **Information** tab in the right pane to view the HBA's version information.

Using the Linux more command

To determine version information on Linux systems enter the following `more` command:

```
more /proc/scsi/qla2xxx/*
```

For 81Q and 82Q only

HP StorageWorks Simple SAN Connection Manager (SSCM) is supported on the Windows based management server and connects to the `qlremote` agent on the Linux server.

Languages

American English

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